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IDENTIFICATION AND INTERPRETATION OF TECTONIC FEATURES

ERTS-A IMAGERY

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Accomplishments

We developed a tectonic model for the development of the Central Coast Ranges in California.

Significant Results

The transverse faults observed in the central Coast Ranges of California are believed to represent the remnants of a major system of shear faults older than the San Andreas system. The transverse shear system is believed to have developed in the Mesozoic when the Pacific Plate was advancing under the North American Plate. Shear faults thus developed due to unequal rates of underthrusting. Our tectonic model indicates that the intrusive belt of the proto-Sierra Nevada and the belt of eugeosynclinal sedimentary belt (Franciscan group) which lay to the west were both subjected to regional left-handed shear. Later development of the San Andreas system as transform faults of the East Pacific Rise changed the tectonic style to right-lateral tangential. The model explains the peculiar distribution of the Franciscan rocks in the Diablo Range east of the San Andreas fault and in Santa Lucia Range west of Nacimiento fault and the presence of Sierra Nevada type granitic blocks in between the two faults in the Salina block.

This model is also consistent with our analysis of the Texas and Parras shears which indicates that the southwestern part of North America has been subjected to a major left-lateral regional shear before the development of the San Andreas fault system.

Published Work:

M. Abdel-Gawad and Linda Tubbesing, 1974, Regmatic transverse shear in Mexico and U. S. southwest-tectonic analysis (Abstract): First International Conference on the New Basement Tectonics: June 3-7, 1974, Salt Lake City, Utah.

Plans for Next Period

We plan to integrate the analysis of data and tectonic models obtained so far.

Practical Applications: None